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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,569	07/18/2003	Carlos Nagib Khalil	Q76639	2109

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

COSTALES, SHRUTI S

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/621,569

Applicant(s)

KHALIL ET AL.

Examiner

Shruti S. Costales

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on October 23, 2003 was filed in compliance with the provisions of 37 CFR § 1.97. Accordingly, the information disclosure statement filed by the applicant has been considered by the Examiner.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference characters are not mentioned in the description: 34, 35, 36, 38, and 39. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy

Art Unit: 1714

must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Specification

3. The abstract of the disclosure is objected to because the applicant makes improper use of legal phraseology, specifically terms such as "comprising". Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

Art Unit: 1714

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "A process for producing biodiesel comprising processing a feed of oleaginous seeds, adding a sodium or potassium ethanoate catalyst, and allowing transesterification to occur obtaining alkyl ester products that are neutralized and formulated into biodiesel".

5. The disclosure is objected to because of the following minor informalities:

- (i) Reference characters 34, 35, 36, 38, and 39 appearing in FIG. 1 are not mentioned in the description. Please refer to paragraph 2 above.
- (ii) The word "residua" is misspelled on page 3 at line 33. Appropriate correction is required.

Claim Objections

6. Claims 1, 10 and 12-13 are objected to because of the following informalities:

Art Unit: 1714

(i) In claim 1, each of the process steps recited in a)-e) should begin with words that are small case as each claim is supposed to be one sentence and capitalizing words in the middle of a sentence is not grammatically correct. It is suggested that the applicant, for example, replace "After" in step a) to "after", and similarly correct remaining steps b)-e).

Further, in claim 1, the phrase "...preparing in a reactor an homogeneous suspension..." appears grammatically incorrect and it is suggested that said phrase be replaced with "...preparing in a reactor a homogeneous suspension... [*Emphasis Added*]".

(ii) Claim 9 recites "having a granulometry up to 20 mesh Tyler", wherein it is suggested that said phrase be replaced with "having a granulometry of up to 20 mesh Tyler" for clarity [*Emphasis Added*].

(iii) Claims 10 and 12-13 appear to contain improper spacing as no space seems to appear between, for example, the numerical identifier for claim 10 and the claim sentence "10.A process...". Claims 12-13 appear to contain similar improper spacing.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, claim 10 is not clear with respect to the

Art Unit: 1714

phrase "conventional fermentation process on the carbohydrates". Appropriate clarification or correction is required.

Overview of the Rejections

8. The following Table organizes the rejections applied to the claims recited in the present invention.

<u>Claim Numbers</u>	<u>Rejections</u>
1-2, 4, 6, 8, and 13	103(a) over Stidham et al. (U.S. Patent Number 6,127,560) in view of Bradin (U.S. Patent Number 5,578,090, cited on PTO-1449 dated October 23, 2003), Drouillard et al. (U.S. Patent Number 6,506,423), and Saam (U.S. Patent Number 5,750,751).
2-3	103(a) over Stidham in view of Bradin, Drouillard, Saam, and further in view of Lidgren (US Pre-Grant Publication Number 2003/0161858).
5	103(a) over Stidham in view of Bradin, Drouillard, Saam, and further in view of Thames et al. (U.S. Patent Number 6,897,255).
7	103(a) over Stidham in view of Bradin, Drouillard, Saam, and further in view of Buchanan et al. (U.S. Patent Number 6,573,396).
9-12	103(a) over Stidham in view of Bradin, Drouillard, Saam, further in view of Buchanan, and further in view of Anderson (U.S. Patent Number 5,710,030).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-2, 4, 6, 8, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stidham et al. (U.S. Patent Number 6,127,560) in view of Bradin (U.S. Patent Number 5,578,090, cited on PTO-1449 dated October 23, 2003), Drouillard et al. (U.S. Patent Number 6,506,423), and Saam (U.S. Patent Number 5,750,751).

Stidham discloses a method of preparing a lower alcohol ester from a soybean oil product used as a biodegradable solvent to a diesel fuel additive (Col. 1, lines 7-10) (also known in the art as "biodiesel"). It is also disclosed, with reference to FIG. 1 of Stidham that soybeans are comminuted to a size ranging from smaller than 200 mesh to as large as approximately one-eighth of an inch (or, 3.175 mm) in average diameter (Col. 4, lines 8-19). Then the comminuted soybeans are heated at elevated temperatures to dry the soybeans (Col. 4, lines 20-29). After cleaning and degumming of the soybeans, the degummed soybean oil is reacted with a lower alkyl alcohol in the presence of an alkaline catalyst (which is well known in the art as a transesterification reaction or alcoholysis) at a temperature of 140° F (or, 60° C) for 60 to 90 minutes, to produce lower alkyl alcohol esters and glycerol (Col. 4, lines 30-56). The ratio of the methyl alcohol added to soybean oil is about 1 to 6.5 and the ratio of sodium hydroxide

Art Unit: 1714

(the alkaline catalyst) to soybean oil is about 1 to 1,000 (Col. 4, lines 53-55). Next, in a glycerine removal step heavy glycerine phase is separated from the lighter lower alkyl alcohol ester phase (Col. 4, lines 57-64). The separated alkyl alcohol ester product is then washed, which is equivalent to neutralizing, with water until the desired degree of purity is achieved (Col. 4, lines 65-67 and Col. 5, lines 1-5). Further, Stidham discloses that the fatty acid glyceride is converted in the range of 90 to 99.5% (Col. 9, claim 7).

Further, while Stidham does not explicitly disclose the use of an anhydrous alcohol for use in the transesterification process, Bradin discloses alcohols having less than approximately one percent water (Col. 9, lines 8-11) for use in transesterification reactions to produce fatty acid alkyl esters used in biodiesel fuels (Col. 3, lines 41-45 and Col. 1, lines 5-7). It would have been obvious to one skilled in the art to use substantially anhydrous alcohol in Stidham's process because saponification or hydrolysis of the triglycerides may be avoided (Col. 9, lines 8-11).

Although Stidham does not explicitly disclose the outcome of the cake removed in step 12 of the partial oil removal step (see FIG. 1 of Stidham; see also step 36 in FIG. 2 and Col. 5, lines 58-60), Drouillard discloses a method of making a ruminant animal feed which includes selecting a protein and carbohydrate containing material such as soybean meal (Col. 3, lines 37-52). It would have been obvious to one skilled in the art to use Stidham's cake removed in step 12 of FIG. 1 as animal feed because soybean meal is a source of proteins and carbohydrates and is suitable for livestock (Col. 3, lines 40-43).

Art Unit: 1714

Further, while Stidham does not disclose the removal of the solids including the seed hulls after the transesterification process is complete, it would have been obvious to one skilled in the art to separate the solids from the reaction mixture in Stidham after transesterification is complete because no criticality is shown in the removal of the solids either before or after the transesterification reaction is complete. It is to be noted that the solids do not participate in the transesterification reaction, therefore it would be obvious to one skilled in the art to remove the solids after the transesterification reaction is complete in Stidham, as disclosed in the presently cited claims. Moreover, according to Saam any precipitated solids during a transesterification reaction are removed by filtration and centrifugation after the reaction is complete (Col. 14, lines 41-48).

Although Stidham discloses that transesterification reaction occurs at a temperature of 60° C and whereas presently cited claim 6 recites a reaction temperature range of 45-55° C, it is to be noted that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties, thereby obtaining the invention as set forth in the presently cited claims.

Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

11. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, and further in view of Lidgren (US Pre-Grant Publication Number 2003/0161858).

The discussion above regarding Stidham, Bradin, Drouillard, and Saam in paragraph 10 above is herein incorporated by reference.

Although Stidham does not explicitly disclose using oily seeds besides soybeans, Lidgren discloses oils from seeds such as sunflower, colza, soybean, peanut, and castor (Page 3, paragraph [0034]). It would have been obvious to one skilled in the art to use the various oils obtained from the listed oil seeds of Lidgren in Stidham's process because these oils have similar desirable properties such as biological compatibility, unctuous viscous liquid or solid easily liquefiable on warming, immiscible with water, and pharmacologically inert (Page 3, paragraph [0032]), wherein all these properties are desirable when preparing a biodiesel that is environmentally friendly and biodegradable, thereby obtaining the invention as set forth in the presently cited claims.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, and further in view of Thames et al. (U.S. Patent Number 6,897,255).

The discussion above regarding Stidham, Bradin, Drouillard, and Saam in paragraph 10 above is herein incorporated by reference.

Although Stidham does not explicitly disclose sodium or potassium ethanoate as catalysts in the disclosed process, Thames discloses sodium and potassium acetate catalysts (Col. 15, lines 12-23), wherein acetate is a synonym for ethanoate. It would have been obvious to one skilled in the art to use the catalysts of Thames in Stidham's process because sodium and potassium acetate are particularly suitable in

Art Unit: 1714

transesterification type reactions (Col. 15, lines 12-13), thereby obtaining the invention as set forth in the presently cited claim.

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, and further in view of Buchanan et al. (U.S. Patent Number 6,573,396).

The discussion above regarding Stidham, Bradin, Drouillard, and Saam in paragraph 10 above is herein incorporated by reference.

Although Stidham does not explicitly disclose using recycled alcohol in the disclosed process, Buchanan discloses using recycled alcohol in a transesterification reactor (Col. 9, lines 3-15). It would have been obvious to one skilled in the art to use the recycled alcohol of Buchanan with Stidham's process because overall process efficiency is increased (Col. 9, lines 1-2), thereby obtaining the invention as set forth in the presently cited claim.

14. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, further in view of Buchanan, and further in view of Anderson (U.S. Patent Number 5,710,030).

The discussion above regarding Stidham, Bradin, Drouillard, Saam, and Buchanan in paragraphs 10 and 13 above is herein incorporated by reference.

Although Stidham does not explicitly disclose fermenting the carbohydrates obtained from the soybean cake to produce ethanol for recycling back to the

Art Unit: 1714

transesterification reactor, Anderson discloses milling oilseeds to produce a vegetable oil and a residual mixture of complex polymeric carbohydrates comprised of celluloses, starches, and others, wherein the complex polymeric carbohydrates are depolymerized to produce a high yield of fermentable sugars, and these sugar-containing mixtures are fermented using yeast, bacteria, or fungi, to thereby convert the sugars to lower alkanols, especially ethanol (Col. 3, lines 24-39). It would have been obvious to one skilled in the art to use the ethanol produced by fermentation as disclosed by Anderson in Stidham's process because the ethanol so produced may be used for transesterification process as one integrated process (Col. 2, lines 4-67), thereby obtaining the invention as set forth in the presently cited claims.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shruti S. Costales whose telephone number is (571) 272-8389. The examiner can normally be reached on Monday - Friday, 7:00 AM - 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 1714

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

SSC
Shruti S. Costales
June 22, 2005

Vasu Jagannathan
VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700